

Personal Finance

7.1 Annuities

7.2 Conditions of a Annuity

Annuity-equal payments on a loan
-equal deposits in an account

May 11-7:37 AM

Dollar Cost Averaging

-investing throughout the year
 i.e. every paycheck to take out the volatility of the market

Apr 23-9:54 AM

Compounding Periods

Daily	365
Weekly	52
Bi weekly	26
Quarterly	4
Monthly	12
Semi Annually	2
Annually	1

May 11-9:07 AM

Calculating Total Loan Amount

Investigation 7.2

Example 3



The Present Value of an Annuity

Devon has just purchased her first car. Her bank has given her a car loan with payments of \$229.19 per month for the first year of the loan at 10.5% per year, compounded monthly.

- What is the actual cost of the car if Devon were to pay for it in cash today?
- How much interest will she pay by choosing the payment plan?

- Interest Rate
- Length of Term
- Payment Frequency

May 16-7:26 AM

Calculating Total Loan Amount

Investigation 7.2

Example 3



The Present Value of an Annuity

Devon has just purchased her first car. Her bank has given her a car loan with payments of \$229.19 per month for the first year of the loan at 10.5% per year, compounded monthly.

- What is the actual cost of the car if Devon were to pay for it in cash today?
- How much interest will she pay by choosing the payment plan?

2600.04

b) $229.19 \times 12 = 2750.28$

- Interest Rate
 - Length of Term
 - Payment Frequency
- 2600.04
 150.24 Interest

May 16-7:26 AM

Example 2

The Payment for an Annuity

T.J. recently graduated from college and owes \$16 000 on a student loan that he must begin to repay. Payments are to be made at the end of each month for the next 2.5 years. Interest is calculated at 9% per year, compounded monthly.

- Determine the amount of each payment.
- Calculate the total amount needed to repay the loan.
- Calculate the total amount of interest that T.J. will pay.

Apr 23-7:37 AM

Example 2 The Payment for an Annuity

T.J. recently graduated from college and owes \$16 000 on a student loan that he must begin to repay. Payments are to be made at the end of each month for the next 2.5 years. Interest is calculated at 9% per year, compounded monthly.

- Determine the amount of each payment.
- Calculate the total amount needed to repay the loan.
- Calculate the total amount of interest that T.J. will pay.

Handwritten notes:

$\$16000 = PV$
 $30 = n$
 $9\% = i$
 $C/Y = 12$
 $P/Y = 12$

$PMT = -597.57$

You would need to make payments of \$597.57 on a \$16000 loan.

b) $597.57 \times 30 = \$17\,927.10$


Apr 23-7:37 AM

Solution

- Use a TVM Solver. Enter the known values.
 - T.J. will make monthly payments for 2.5 years.
 $2.5 \times 12 = 30$, so $N = 30$.
 - The annual interest rate is 9%, so $I\% = 9$.
 - T.J. owes \$16 000, so $PV = 16000$.
 - You are solving for the payment, so set $PMT = 0$ for now.
 - At the end of 2.5 years, the loan will be paid off, so $FV = 0$.
 - Payments are made monthly, so $P/Y = 12$.
 - Interest is compounded monthly, so $C/Y = 12$.
 - Payments are made at the end of the month, so set PMT to END.

Use the arrow keys to move the cursor to **PMT**. Press **ALPHA** **ENTER**. The payment is negative since it is money that T.J. owes.

T.J.'s monthly payment will be \$597.57.



- There are 30 payments altogether.
 $597.57 \times 30 = 17927.1$
 T.J. will pay a total of \$17 927.10 for the loan.
- To determine the amount of interest, subtract the amount of the loan from the total paid for the loan.
 $17\,927.1 - 16\,000 = 1927.1$
 T.J. will pay \$1927.10 in interest.

Apr 23-7:38 AM



Apr 23-7:36 AM

7.1 Annuity q. 1-7, 9*
 p. 409 & 410

7.2 Conditions of an Annuity
 q 1-5, 7-9 p.417 - 418

May 11-9:34 AM

Closing Question
 MAP 4C
 7.2

Alex needs to repay a 14 000 debt. His bank offers personal loans with terms of one to five years at 9.25% per year, compounded monthly.

Determine the monthly payment for a three year term.

N=
 I%=
 PV=
 PMT=
 FV=
 P/Y=
 C/Y=
 PMT= END

Calculate the total interest paid on the loan.

Determine Alex's payment if he chooses to make bi-weekly payments.

N=
 I%=
 PV=
 PMT=
 FV=
 P/Y=
 C/Y=
 PMT= END

Calculate the total interest paid on the loan.

May 16-7:29 AM